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IOTWS Report (Australia)

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Australia is a founding member of the IOTWS and actively participates through the Intergovernmental Coordination Group (ICG). Mr Rick Bailey from the Australian Bureau of Meteorology is currently the Chair of the ICG. Australian representatives from Bureau and Geoscience Australia provide leadership roles and contributions to the Working Groups and Task Teams of the ICG. Australia also hosts and financially supports the ICG Secretariat at Bureau's Regional Office in Perth, staffed by Mr Tony Elliott (see following details). The ICG meets regularly. Reports from its nine Sessions can be downloaded from the site of the Intergovernmental Oceanographic Commission (IOC) of UNESCO at <http://www.ioc-tsunami.org/>. There are 28 countries involved in the IOTWS, being states in and bordering the Indian Ocean basin.

New Service for Regional Tsunami Threat Information for Indian Ocean since 31 March 2013

The enhanced system of three Regional Tsunami Service Providers (RTSPs - operated by Australia, India and Indonesia) officially took over from the Interim Advisory Service operated by the USA and Japan on 31 Mar 2013, as agreed at the 9th Session of the ICG/IOTWS in Jakarta 2012. The three RTSPs are now solely responsible for providing tsunami threat information to the 28 National Tsunami Warning Centres (NTWCs) in the Indian Ocean.

The Interim Advisory Service (IAS) for the Indian Ocean had been provided by the Pacific Tsunami Warning Centre (PTWC) in Hawaii and the Japan Meteorological Agency (JMA) in Japan since 2005. It was quickly established after the devastating Indian Ocean Tsunami of 26 December 2004, and has been supported by the US and Japan while Indian Ocean countries developed their own capability. The system of RTSPs now completely replaces the IAS, following an overlap and successful evaluation period between 2011 and 2013.

The new RTSPs each provide much more detailed tsunami threat information for Indian Ocean countries than the IAS (see example in Figure 1 and 2). This helps countries to better prepare national tsunami warnings, save lives and reduce the frequency of false alarms. Although the assessments are independent, the three RTSPs have worked together under the ICG/IOTWS to ensure the information provided for the agreed coastal zone for each country is the same type and in standard formats.

To avoid potential for conflicting information from the three RTSPs, the RTSPs are not responsible for deciding on national warning status for each country. That is the sovereign role of the nationally designated 28 National Tsunami Warning Centres (NTWCs), who will

utilise the independent assessments to make their own decisions about the level of threat and inform their own communities. The RTSPs will only reflect the warning status decided by each NTWC on the RTSP web sites.

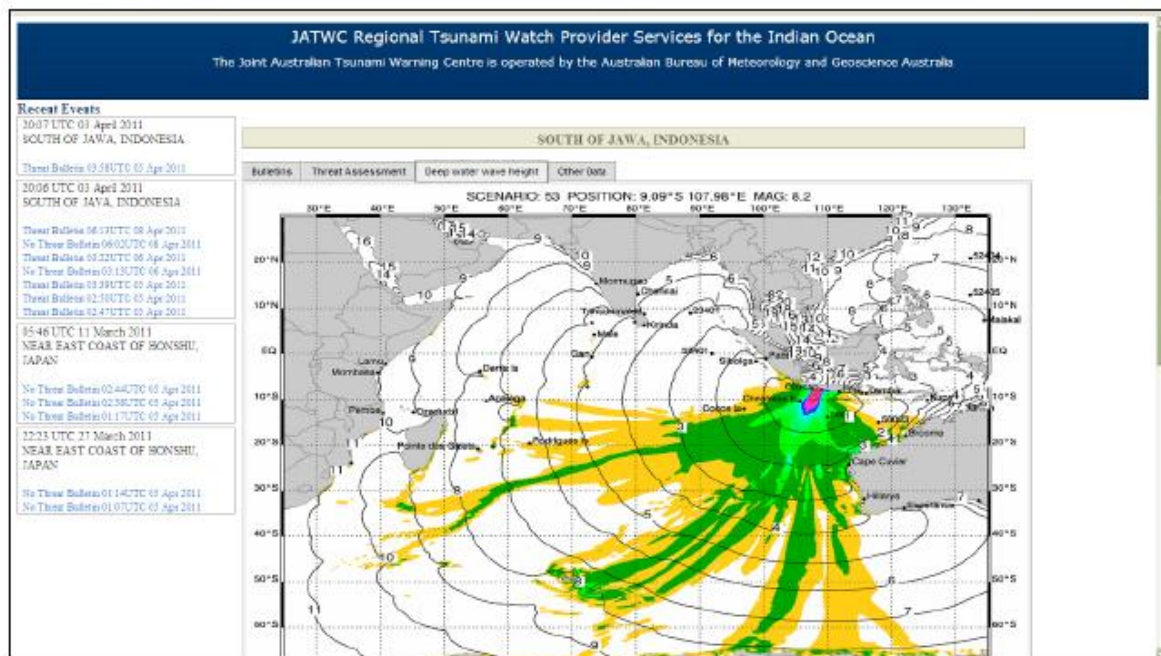


Figure 1: *Example of more detailed tsunami threat information being provided to National Tsunami Warning Centres (NTWCs) in the Indian Ocean by Regional Tsunami Service Providers (RTSPs).*

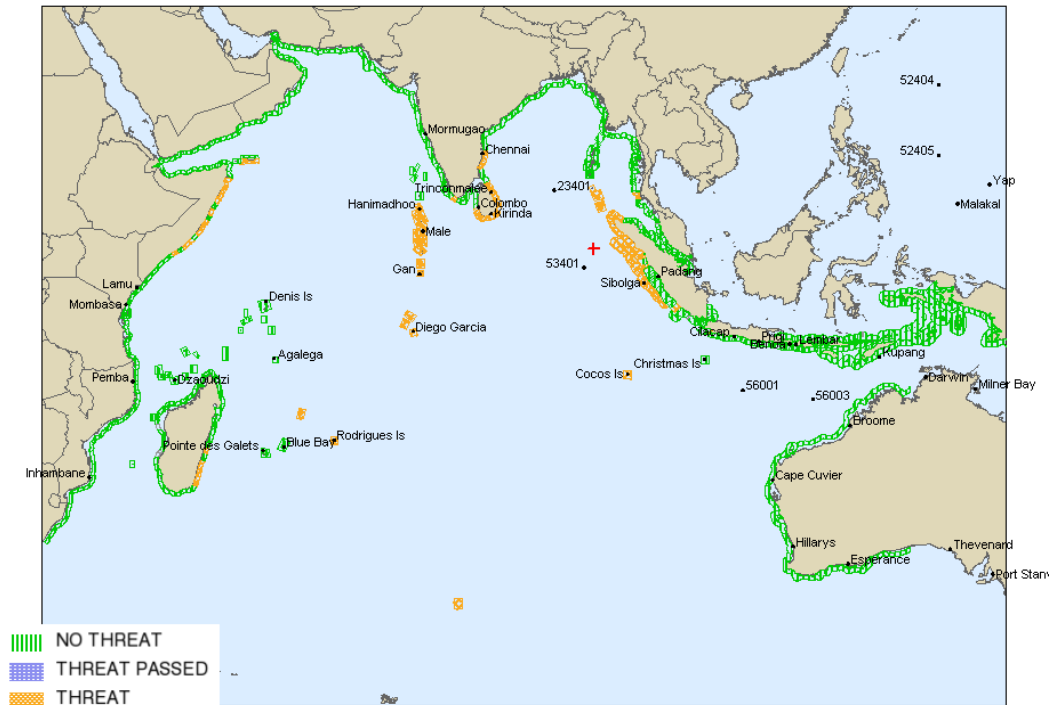


Figure 2: *Tsunami threat information provided to National Tsunami Warning Centres (NTWCs) in the Indian Ocean by the Australian Regional Tsunami Service Provider (RTSP for the 12 April 2012 North Sumatra earthquake and tsunami event.*

Australia's contribution as a RTSP is provided through the Joint Australian Tsunami Warning Centre (JATWC), which is operated by the Bureau of Meteorology and Geoscience Australia. The JATWC has developed the capability to extend the state-of-the-art, comprehensive tsunami threat assessment and advice it has provided for Australia since 2008, to now also include provision of threat information to other countries bordering the Indian Ocean.

Coastal and Deep-Ocean Sea Level Data

The IOTWS relies on sea level data provided in real-time from coastal and deep-ocean sea level stations around the Indian Ocean to verify if a tsunami may have been generated by undersea earthquakes (see Figure 3 and Figure 4). Not all earthquakes generate tsunamis, so it's vitally important (if time permits) to verify if a tsunami was generated before warnings are issued. This helps reduce the possibility of false alarms.

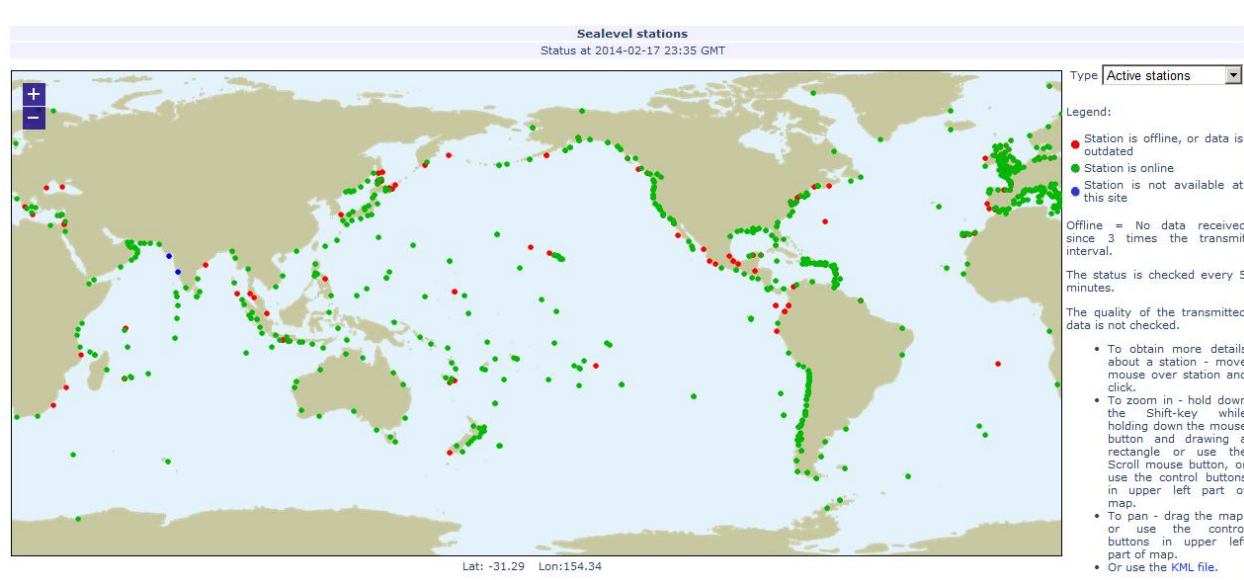


Figure 3: Coastal sea level stations reporting in real-time to RTSPs and NTCs on the Global Telecommunication System (GTS) of the World Meteorological Organisation (WMO), valid as at 17 Feb 2014.

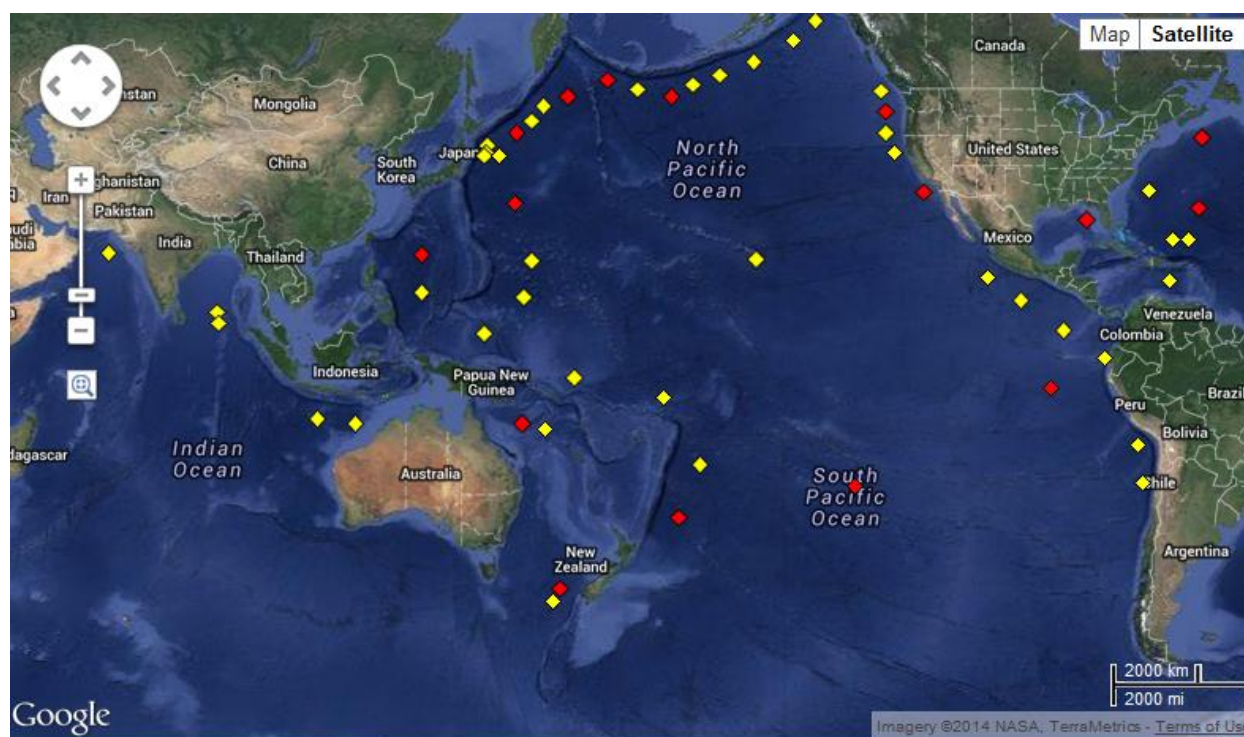


Figure 4: Locations of deep-ocean tsunami buoys providing critical sea level data in real-time to RTSPs and NTCs to assist tsunami warning decisions (red means those stations currently non-functioning, valid as at 17 Feb 2014).

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Vandalism of Deep-Ocean Tsunami Monitoring Buoys

Damage to ocean observing systems takes many forms including ship impact damage, incidental damage (e.g., fouling from fishing lines, nets or cables), damage from direct exploitation of moorings as fish aggregation devices, intentional damage, and theft of entire systems or component parts.

The tsunami warning community are deeply concerned that the rate of damage continues to be high in the Indian and Pacific oceans. The damaged ocean observing systems cause loss of critical ocean data, degraded weather and marine forecast capabilities, high cost of repair or replacement, and undermine confidence in the tsunami warning system, which could result in significant loss of life and property as well as costly evacuations in response to false tsunami warnings. Most recently the deep-ocean tsunami buoy deployed by Australia in the Coral Sea was vandalised and rendered inoperable.

The 2009 UN General Assembly Resolutions on Oceans and Law of the Sea (64/71, para 172) and on Sustainable Fisheries (64/72 para 109) called on States and appropriate UN agencies to take appropriate action to address intentional and unintentional damage to ocean observing systems. The community is encouraged by action of the Western and Central Pacific Fisheries Commission and the Inter-American Tropical Tuna Commission to protect moored ocean observing systems.

The IOC of UNESCO has urged Member States to recognise damage to ocean observing systems in national statutes, harmonise their approaches as appropriate, and cooperate to prevent, detect, deter, report, investigate and prosecute such acts of damage. The 26th Session of the IOC Assembly, Paris, 22 June - 5 July 2011 invited:

- The IOC and WMO to promote the systematic capture and exchange of records of damage to ocean observing systems and to conduct comprehensive cost benefit assessments taking into account both economic and social impacts of damage to ocean observing systems;
- The FAO and regional fisheries management organizations, especially those with the competence to manage highly migratory fisheries, to adopt binding measures to prevent and minimize damage to ocean observing systems;
- The FAO, IOC and WMO to cooperate directly to develop means to promote effective enforcement of measures adopted by regional fisheries management organizations to protect ocean observing platforms, and to develop education and outreach programs to bring greater awareness to fishing communities of this problem.
- UN agencies, including IOC, WMO, IMO, and FAO, working with Member States and industry, to share information and foster education and outreach to safeguard human lives and property through protecting the ocean observing system.

Other Inter-Regional Coordination

After the 2004 tsunami disaster the International Maritime Organization (IMO) decided that it needed to provide better dissemination of tsunami advice to shipping through official channels that are coordinated globally as part of the Global Maritime Distress & Safety System (GMDSS) including satellite broadcasts via INMARSAT and the coast radio NAVTEX service. That decision cut across existing coordination arrangements already in

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place under the auspices of WMO and IOC. The Expert Team on Maritime Safety Services of the IOC/WMO Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM) continues to review arrangements. A deal of additional coordination is still required to subsequently provide the IMO with a more helpful and practical inter-agency operational framework for providing tsunami warning advice to vessels at sea. The UNESCO/IOC overarching coordination group for warning of sea level hazards (Working Group on Tsunamis and Other hazards related to sea level Warnings and mitigation Systems TOWS-WG) further discussed the issue at its most recent meeting in Paris 9-13 February 2014. The Chair of the TOWS-WG Inter-ICG Task Team on Tsunami Watch Operations will communicate with the Executive Secretary of IOC and request her to inform IMO, IHO, WMO on what tsunami products are available and seek feedback on requirements and better ways of disseminating tsunami threat information to the maritime community.

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